

Rhode Island 2007 Annual Monitoring Network Plan

On October 17, 2006, the United States Environmental Protection Agency (EPA) revised its ambient air monitoring requirements in 40 CFR parts 53 and 53. The revised regulations require states to submit a monitoring network plan to the EPA annually beginning in July 2007. The plan must provide a description of the state's air monitoring network, demonstrate that the network conforms to EPA requirements, and discuss any plans to modify the network in the 18 months following the plan submittal. Proposed network modifications are subject to the approval of the EPA Regional Administrator. The plan must be posted for public review for 30 days before submittal to the EPA.

To view the Rhode Island 2007 Annual Monitoring Network Review click [here](#). The Rhode Island Department of Environmental Management will accept comments on this plan until 4:00 p.m. on Friday, July 13, 2007. Comments should be submitted electronically or in writing to:

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**STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR RESOURCES**

Rhode Island 2007 Annual Monitoring Network Plan



Posted for Public Review on June 12, 2007

Introduction

On October 17, 2006, the United States Environmental Protection Agency (EPA) published a Federal Register notice (FR 71:61236) revising the ambient air monitoring requirements in 40 CFR parts 53 and 53. The modified regulations require states to submit a monitoring network plan to the EPA annually beginning on July 1, 2007. The plan must provide a description of the current network, demonstrate that the network conforms to requirements in the rule, and discuss any plans to remove or move a monitoring station in the 18 months following the plan submittal. Proposed network modifications are subject to the approval of the EPA Regional Administrator. The plan must be posted for public comments for 30 days before submittal to the EPA. This document will serve as Rhode Island's 2007 annual plan.

The Rhode Island Department of Environmental Management (RI DEM), in conjunction with the Rhode Island Department of Health (RI HEALTH), operates a network of air monitoring stations that measure ambient concentrations of pollutants for which a National Ambient Air Quality Standard (NAAQS) has been established. Those pollutants, which are known as criteria pollutants, include ozone (O_3), particulate matter smaller than 10 microns (PM_{10}) and particulate matter smaller than 2.5 microns ($PM_{2.5}$), nitrogen dioxide (NO_2), sulfur dioxide (SO_2) and carbon monoxide (CO). Lead is also a criteria pollutant, but is not currently monitored in the State because ambient levels are substantially below the NAAQS for that pollutant. The criteria pollutant monitoring sites are part of the EPA's State or Local Air Monitoring Stations network (SLAMS).

In addition, RI DEM and RI HEALTH operate monitors measuring toxic air pollutants and ozone precursors, substances that participate in photochemical reactions in the atmosphere that result in the formation of ground-level ozone. To those ends, Rhode Island operates one site that is part of the National Air Toxics Trends Sites (NATTS) network, two that are part of the Photochemical Assessment Monitoring Stations (PAMS) network and one that is part of the $PM_{2.5}$ Speciation Trends Network (STN).

Table 1 lists the locations of the nine air monitoring stations currently operating in the State, along with the parameters monitored and monitoring methods used at each of the stations. The locations of those sites are shown in Figures 1-4. All of these sites have been approved by EPA Region I as meeting the siting criteria specified in Subpart B of the monitoring rule. All criteria pollutants are monitored, as required in the rule, using Federal Reference Methods or Federal Equivalent Methods and monitors are operated according to the procedures specified in Quality Assurance Project Plans that have been approved by EPA. All sites are located in the Providence-Fall River-Warwick, RI-MA Metropolitan Standard Area.

The EPA rules require the establishment of a network of core multipollutant monitoring (NCore) stations by 2011; particulate matter ($PM_{2.5}$, speciated $PM_{2.5}$ and the coarse fraction of PM_{10} ($PM_{10-2.5}$)), O_3 , SO_2 , CO, nitrogen oxides (NO, NO_2 and NO_y , which is the sum of reactive and nonreactive

nitrogen oxides), lead (at ten sites nationally) and basic meteorological parameters will be monitored at those sites. Most states, including Rhode Island, must establish one NCore site which, according to EPA guidance, should optimally be co-located with a PAMS or NATTS site. States must submit a plan by July 1, 2009 identifying how they will comply with the NCore requirements. RI DEM has not yet determined where the State's NCore site will be located, but it is likely that it will either be operated at the State's Type II (maximum ozone precursor impact) PAMS site near the Francis School in East Providence or at the State's NATTS site at the Urban League building in Providence.

The following is a discussion, by pollutant, of the current monitoring network and Rhode Island's plans for modification of the network in the next 18 months.

Ozone (O₃)

The current O₃ monitoring network is as follows:

SITE	MEASUREMENT SCALE	MONITORING OBJECTIVE
Alton Jones Campus Victory Highway West Greenwich	Regional (PAMS)	Upwind background Population exposure
USEPA Laboratory 27 Tarzwell Drive Narragansett	Regional (PAMS)	Population exposure
Francis School 64 Bourne Avenue E. Providence	Neighborhood	Maximum precursor emissions impact Population exposure

Minimum number of O₃ sites required by EPA: 2

NAAQS for O₃: 80 ppb (NAAQS is exceeded when the average of the 4th highest daily eight-hour concentration measured in 3 consecutive years is 85 ppb or higher)

Recent 3-year averages of fourth high eight-hour readings (Design Values):

	W. Greenwich	Narragansett	E. Providence
2000 - 2002	97.3	93.3	91.3
2001 - 2003	95.7	95.7	93.0
2002 - 2004	87.3	90.7	84.7
2003 - 2005	84.0	89.3	82.3
2004 - 2006	83.0	85.7	81.0

Although the Rhode Island network has one more monitor than the minimum number required, it is important to continue to operate all of the current monitors for the following reasons:

- Ground-level ozone levels have decreased in the past several years; however, daily levels are highly influenced by weather conditions. There continue to be several days each summer when ozone concentrations at one or more of the Rhode Island stations rise to a level high enough to be classified as unhealthy according to the EPA's Air Quality Index (AQI).
- The three sites represent three distinct geographical areas that are affected differently by some weather patterns and therefore experience very different ozone levels on some days.
- The availability of real-time ozone data from the three ozone sites enables RI DEM to issue area-specific health advisories as appropriate and to provide residents with real-time information about ozone concentrations and associated health risks in their neighborhoods.
- The EPA is currently evaluating the adequacy of the current ozone standard and is expected to propose a more stringent NAAQS in the near future. It is likely that, given the trend towards increasingly more stringent standards, Rhode Island will need to continue to measure ozone levels for the foreseeable future in order to track compliance with those standards.

In consideration of the above issues, no changes to the Rhode Island ozone network are planned in the next 18 months.

Carbon Monoxide (CO)

The current CO Monitoring network is as follows:

SITE	MEASUREMENT SCALE	MONITORING OBJECTIVE
Case Mead Building 76 Dorrance Street Providence	Microscale	Highest concentration Population exposure
Francis School 64 Bourne Avenue E. Providence	Neighborhood	Maximum precursor emissions impact Population exposure

Minimum number of CO sites required: 0

NAAQS: 35 ppm - 1 hour average (2nd maximum yearly value)
9 ppm - 8 hour average (2nd maximum yearly value)

Highest 2nd maximum yearly CO value recorded in the last five years:

7.9 ppm – 1 hour average (23% of NAAQS), recorded at Providence site
2.7 ppm – 8-hour average (30% of NAAQS), recorded at Providence site

Last year that the CO NAAQS was exceeded at a Rhode Island site: 1984

Last year that a CO measurement in the moderate AQI range was recorded: 2001

The usefulness of the data currently collected by the CO monitors in Rhode Island is limited, due to the following factors:

- Concentrations have been consistently below the NAAQS for more than 20 years.
- Current levels are significantly below the NAAQS.
- All CO readings in the past five years have been in the good air quality range, and thus measurements have not been provided useful health related information for the AQI.
- Due to the trend toward lower emissions in motor vehicles, it is very unlikely that CO levels will increase significantly in the coming years.

The new EPA regulations eliminate minimum requirements for the number of CO monitors in a state, except that CO monitors must be operated at Type II PAMS sites and will be required at NCore sites. Since the East Providence site is currently a PAMS site and may become the State's NCore site, RI DEM plans to continue to operate the CO monitor at that site. Due to the factors discussed above however, RI DEM believes that the Dorrance Street, Providence CO monitor is no longer providing useful data and plans to discontinue operation of that monitor in 2007. RI DEM will work with the EPA to develop alternative methods for tracking CO in the State to ensure that CO levels do not become problematic in the future

Sulfur Dioxide (SO₂)

The current SO₂ monitoring network is as follows:

SITE	MEASUREMENT SCALE	MONITORING OBJECTIVE
Case Mead Building 76 Dorrance Street Providence	Neighborhood	Highest concentration Population exposure
Brown University 10 Prospect Street Providence	Neighborhood	Population exposure

Minimum number of SO₂ sites required: 0

NAAQS: 0.5 ppm, 3 hour average (2nd maximum yearly value)
0.14 ppm, 24-hour average (2nd maximum yearly value)
0.03 ppm, annual average

Highest annual 2nd maximum SO₂ values recorded in the last five years:

0.048 ppm, 3 hour average (10% of NAAQS), recorded at Brown University site
0.027 ppm, 24-hour average (19% of NAAQS), recorded at Brown University site

Highest annual average SO₂ value recorded in the last five years

0.0070 ppm, (23% of NAAQS), recorded at Brown University site

Last year that the SO₂ NAAQS was exceeded: Standard has never been exceeded.

Last year that a SO₂ measurement was in the moderate AQI range: 2001

As with CO, the usefulness of the data currently collected by the SO₂ monitors in Rhode Island is limited, due to the following factors:

- Concentrations have been consistently below the NAAQS since measurements began.
- Current levels are significantly below the NAAQS.
- All SO₂ readings in the past five years have been in the good air quality range, and thus measurements have not been provided useful health related information for the AQI.

The new EPA regulations eliminate the minimum requirements for SO₂ monitoring networks, except that SO₂ monitoring will be required at NCore sites. Since the current SO₂ monitors are not generating data that are useful for determining compliance with the NAAQS or for the AQI, RI DEM plans to discontinue SO₂ monitoring at the Dorrance St. site in 2007. Operation of the SO₂ monitor at the Brown University site will be continued until an NCore site is selected and monitoring for that pollutant at that site begins.

Nitrogen Dioxide (NO₂)

The current NO₂ monitoring network is as follows:

SITE	MEASUREMENT SCALE	MONITORING OBJECTIVE	SCHEDULE
Brown University 10 Prospect Street Providence	Neighborhood	Population exposure	Continuous Year round
Francis School 64 Bourne Avenue E. Providence	Neighborhood (PAMS)	Population exposure	Continuous June-August
Alton Jones Campus Victory Highway West Greenwich	Regional (PAMS)	Population exposure Upwind background	Continuous June-August

Minimum number of NO₂ sites required: 0

NAAQS: 0.052 ppm, annual average

Highest annual average NO₂ value recorded in the last five years: 0.0188 ppm (35% of NAAQS)

Last year that the NO₂ NAAQS was exceeded: Standard has never been exceeded.

Last year that a NO₂ measurement was in the moderate AQI range: Since there is no short-term NAAQS for NO₂, this pollutant is not used for the AQI.

There are two reasons for monitoring ambient levels of NO₂. The year-round monitor at Brown University is designed to track Rhode Island's attainment with the NAAQS for NO₂, while the monitors at the other stations, which currently operate only in June, July and August, track levels of NO₂ and other oxides of nitrogen because they are ozone precursors.

As with CO, and SO₂, the NO₂ data collected to track NAAQS compliance is of limited use because the levels measured are significantly below the NAAQS and have been so for many years. Further, the new EPA regulations eliminate the minimum requirements for NO₂ networks,

except at PAMS and NCore sites. Therefore, RI DEM plans to discontinue NO₂ monitoring at the Brown University site when the NCore site is selected and year-round monitoring for NO₂ and oxides of nitrogen begins at that location.

Particulate Matter:

Particles smaller than 10 microns (PM₁₀)

The current PM₁₀ monitoring network is as follows:

SITE	MEASUREMENT SCALE	MONITORING OBJECTIVE	SCHEDULE
Vernon Trailer Vernon Street Pawtucket	Middle	Population exposure	24-hour 1 in 6 day
Johnson & Wales 111 Dorrance Street Providence	Neighborhood	Population exposure	24-hour 1 in 6 day
Urban League 212 Prairie Avenue Providence	Neighborhood (NATTS)	Population exposure Highest concentration	24-hour 1 in 6 day
Alton Jones Campus Victory Highway West Greenwich	Regional	Upwind background	24-hour 1 in 6 day

Minimum number of PM₁₀ sites required: 2 - 4

NAAQS: 150 µg/m³, 24-hour average (99th percentile value)
50 µg/m³, annual average

Highest PM₁₀ values recorded in the last five years:

73 µg/m³, 24-hour average (49% of NAAQS), recorded at Vernon St.
24.5 µg/m³, annual average (49% of NAAQS), recorded at Vernon St.

Last year that the PM₁₀ NAAQS was exceeded: Standard has never been exceeded.

Last year that a PM₁₀ measurement was in the moderate AQI range: Since PM₁₀ is measured using a filter-based method, results are not immediately available and are not used for the AQI.

Based on the size of the Providence urban area and the historical levels of PM₁₀ measured in the State, Rhode Island is required to operate a minimum of 2 - 4 PM₁₀ sites. Since Rhode Island is currently operating four sites and is not measuring levels close to the NAAQS at any of the sites, a site could be discontinued without violating the minimum criteria.

PM₁₀ samples are collected at the Urban League site in Providence primarily because it is a NATTS site; those samples are analyzed for several metals. Therefore, PM₁₀ sampling at that location cannot be discontinued. The Alton Jones, W. Greenwich site provides useful information about background concentrations of PM₁₀ in Rhode Island. The Vernon St., Pawtucket site, which is adjacent to I-95, tends to record the highest PM₁₀ concentrations. Therefore, if one site were to be discontinued, it would be the site at the Johnson & Wales Library in downtown Providence.

The Johnson & Wales site is approximately one mile from the Urban League location. PM₁₀ levels at that site have tended to be similar to those at the Urban League or Vernon Street sites since it began operating in 2004. RI DEM plans to continue to operate this site through the end of 2007 and then to evaluate whether the PM₁₀ concentrations at this site are sufficiently different from those measured at the Urban League and Vernon Street sites to justify the continuing operation of the site.

Fine Particulate Matter (Particulate Matter smaller than 2.5 microns, or PM_{2.5})

The current PM_{2.5} Federal Reference Method (FRM) monitoring network is as follows:

SITE	MEASUREMENT SCALE	MONITORING OBJECTIVE	SCHEDULE
Vernon Trailer Vernon Street Pawtucket	Middle	Population exposure	24-hour 1 in 3 day
Hallmark Building 695 Eddy Street Providence	Urban	Population exposure	24-hour 1 in 3 day
Urban League 212 Prairie Avenue Providence	Neighborhood	Population exposure Highest concentration	24-hour daily
Francis School 64 Bourne Avenue E. Providence	Urban	Population exposure Highest concentration	24-hour daily
Alton Jones Campus Victory Highway West Greenwich	Regional	Population exposure General/Background Regional Transport	24-hour 1 in 3 day

Minimum number of PM_{2.5} FRM sites required: 3

NAAQS: 35 µg/m³, 24-hour average (98th percentile value, average of 3 years)
15 µg/m³, annual average

Highest 24-hour 98th percentile PM_{2.5} level recorded in the last five years (3 year average):

32.6 µg/m³ (93% of NAAQS), recorded at Vernon St.

Highest annual average PM_{2.5} level recorded in last five years:

13.0 µg/m³ (87% of NAAQS), recorded at Vernon St.

Last year that the PM_{2.5} NAAQS was exceeded: Standard has never been exceeded, but the one year 98th percentile 24-hour average was over the NAAQS in 2003 at Vernon.

As stated above, a monitor is in violation of the 24-hour average PM_{2.5} standard if the average of the 98th percentile 24-hour readings at that site in three consecutive years is 35 µg/m³ or higher. Although none of the monitors meet that criterion, and thus none of the monitors are classified as nonattainment for the NAAQS, during the five year period 2001 – 2006 there were a total of twenty days that the PM_{2.5} levels at one or more sites in the State were at or above 35 µg/m³ and, therefore, the air quality was unhealthy.

According to the EPA regulations, Rhode Island must maintain a minimum of three PM_{2.5} monitors, which is fewer than the existing network of 5 sites. However, the regulations further state that the minimum number provides states with some flexibility, but it is expected that most states will maintain networks in excess of the minimum requirements. Given the health significance of the PM_{2.5} levels recorded in the State, RI DEM plans to maintain the network at its current level at the present.

Each of the current sites serves an important role in providing a comprehensive picture of levels of PM_{2.5} in Rhode Island. The Vernon Street site, which is sited near I-95, generally records the highest PM_{2.5} levels in the State. The Urban League PM_{2.5} monitor is co-located with several other types of PM monitors, including monitors measuring PM₁₀, PM₁₀ metals, speciated PM_{2.5}, continuous PM_{2.5}, PM_{2.5-10} and black carbon so that site provides a comprehensive picture of the concentrations and composition of PM in an urban area of the State. The East Providence site may become Rhode Island's NCore site, and, if so, PM_{2.5} measurements will be required at that site. The Eddy Street site, which has been operational since 2004, is located in a neighborhood that is in flux, due to nearby highway reconstruction. RI DEM will reevaluate that site after the new highway pattern is open to determine whether it continues to be the most appropriate site to

measure maximum exposure associated with highway sources in that area. The Alton Jones site is necessary because it is the only background and transport site for the State.

In addition to the PM_{2.5} FRM monitors discussed above, Rhode Island also operates continuous PM_{2.5} Beta Attenuation (BAM) monitors at three locations, Urban League, Alton Jones and the EPA Laboratory in Narragansett. BAM readings are not equivalent to the FRM measurements, and thus cannot be used to determine whether a site is in attainment with the PM_{2.5} NAAQS. However, the continuous monitors provide real-time data that are invaluable for forecasting and tracking PM_{2.5} levels for the AQI. In the future, when continuous units are approved by the EPA as FRM units, RI DEM anticipates a gradual conversion of its filter-based FRM network to continuous FRM monitors, as funds become available.

Additional PM Measurements

RI DEM and RI HEALTH operate five other types of monitors at the Urban League site aimed at better defining the composition of PM. Three of those types of monitors are operated as part of the NATTS requirements:

- Metals analysis of PM₁₀ samples collected every sixth day
- Analysis of PM₁₀ samples collected on the same schedule on treated filters for hexavalent chromium, the most toxic form of chromium
- An aethalometer which continuously measures black carbon, an indicator of diesel particulate.

In addition, a PM_{2.5} speciation sampler system, which is part of the national STN network, is operated at the Urban League site every third day and a low volume PM₁₀ monitor designed to be used in conjunction with the PM_{2.5} monitor to calculate the concentration of the coarse PM fraction (PM_{2.5-10}) is operated every 6th day. Note that an aethalometer is also operated at the East Providence site. RI DEM has no plans to modify any of these measurements. However, if a site other than Urban League, e.g. East Providence, is chosen as the NCore site, the PM_{2.5} speciation sampler will be moved to that site by 2011.

Volatile Organic Compounds (VOC) and Carbonyls

The current VOC/carbonyl network is as follows:

SITE	POLLUTANTS MONITORED	PURPOSE	SCHEDULE
Vernon Trailer Vernon Street Pawtucket	VOC	Population exposure near highway	24-hour 1 in 6 day
Urban League 212 Prairie Avenue Providence	VOC and carbonyls	Population exposure in urban area NATTS site	24-hour 1 in 6 day
Francis School 64 Bourne Avenue E. Providence	VOC and carbonyls	Population exposure downwind of urban area PAMS Type II site – maximum ozone precursor impacts	24-hour 1 in 6 day June – August 8 3-hr samples/day
Alton Jones Campus Victory Highway West Greenwich	VOC	Population exposure in rural area PAMS type I site- Background/Transport of ozone precursors	24-hour 1 in 6 day

The data collected at these sites provide information about levels of air toxics and ozone precursors in the State. This information also provides a framework to aid in understanding the results of VOC and carbonyl samples collected as part of special studies in other parts of the State.

As required for Type II PAMS sites, eight 3-hour VOC samples are also collected daily and eight 3-hour carbonyl samples are collected every third day at the East Providence site during June, July and August. Eight 3-hour samples per day are also collected at the Alton Jones site during a limited number of ozone episodes in the summer months. RI DEM is not planning any changes to the VOC/carbonyl monitoring network in the next 18 months.

The revised EPA regulations require states to operate a PAMS network only if they are classified as serious or higher nonattainment areas for the 8-hour ozone NAAQS. Rhode Island is a moderate nonattainment area for that standard, so it is no longer required to maintain a PAMS network. However, since the data collected at the PAMS site are valuable for a variety of purposes, including evaluating exposures to air toxics and verification of models, Rhode Island plans to retain this network. In addition to the pollutants already identified, meteorological parameters are measured at the PAMS sites. To fulfill PAMS requirements for upper air data, Rhode Island uses data collected at the Brookhaven, New York meteorological site.

Summary of Proposed Changes in the Rhode Island Monitoring Network

In summary, RI DEM plans to modify the current monitoring network as follows:

- Monitoring of SO₂ and CO will be discontinued at the Case Mead Building on Dorrance Street in downtown Providence in 2007. RI DEM is currently discussing with the EPA appropriate alternatives for tracking maintenance of compliance with the CO NAAQS.
- When an NCore site is selected and year-round monitoring for NO₂ and SO₂ is begun at that site, monitoring for those pollutants will be discontinued at the Brown University site.
- At the end of calendar year 2007, RI DEM will evaluate the PM₁₀ data collected at the Johnson & Wales library on Dorrance Street in downtown Providence to determine whether the data collected at that location are sufficiently different from those generated at the Urban League and Vernon Street sites to justify the continuing operation of the Johnson & Wales site.
- When the EPA approves continuous monitors as equivalent to FRM filter-based systems, RI DEM will begin to convert its FRM network to equivalent continuous instruments as funds permit.

RI DEM understands that all network modifications that involve discontinuation or moving of any sites are subject to EPA approval, even if the remaining network meets EPA's minimum requirements.

TABLE 1: MONITORING SITES

Site	AIRS Code	Latitude Longitude	Parameter Measured	Method Of Sampling	EPA Method Designation
Vernon Trailer Vernon Street Pawtucket	440070026	41.874655 -71.411667	PM-2.5	Lo Vol	Reference
			PM-10s	Hi Vol	Reference
			VOC	Canisters, GC/FID/MS	Reference
Johnson & Wales 111 Dorrance Street Providence	440070027	41.822686 -71.411089	PM-10	Hi Vol	Reference
Hallmark Building 695 Eddy Street Providence	440070028	41.80933 -71.40743	PM-2.5	Lo Vol	Reference
Brown University 10 Prospect Street Providence	440070012	41.825556 -71.405278	Oxides of Nitrogen	Chemiluminescence	Reference
			Nitrogen Dioxide	Chemiluminescence	Reference
			Sulfur Dioxide	Simulated Fluorescence	Equivalent
Case Mead Building 76 Dorrance Street Providence	440071009	41.823611 -71.411667	Carbon Monoxide	Gas Filter Correlation	Equivalent
			Sulfur Dioxide	Simulated Fluorescence	Equivalent
USEPA Laboratory 27 Tarzwell Drive Narragansett	440090007	41.491667 -71.427778	Ozone	U.V. Photometric	Reference
			PM-2.5	Beta Attenuation/Cont	N/A
			Wind Speed	Anemometer	N/A
			Wind Direction	Wind Vane	N/A
			Temperature	Spot Reading	N/A
Francis School 64 Bourne Avenue E. Providence	440071010	41.840920 -71.36094	Oxides of Nitrogen	Chemiluminescence	Reference
			Nitrogen Dioxide	Chemiluminescence	Reference
			VOC	Canisters, GC/FID/MS	Reference
			Carbon Monoxide	Gas Filter Correlation	Equivalent
			Ozone	U.V. Photometric	Reference
			PM-2.5	Lo Vol	Reference
			Carbonyls	HPLC Cartridges	Reference
			Black Carbon	Aethalometer	N/A
			Wind Speed	Anemometer	N/A
			Wind Direction	Wind Vane	N/A
			Barometric Pressure	Barometer	N/A
			Temperature	Spot Reading	N/A
			Relative Humidity	Plastic Film	N/A
			Solar Radiation	Pyranometric	N/A
			UV Radiation	UV Photometric	N/A
			Precipitation	Bucket/Continuous	N/A

Site	AIRS Code	Latitude Longitude	Parameter Measured	Method Of Sampling	EPA Method Designation
Urban League 212 Prairie Avenue Providence	440070022	41.807949 -71.415103	PM-2.5	Lo Vol	Reference
			PM-2.5	Beta Attenuation/Cont	N/A
			Speciated PM-2.5	Speciation Monitor	N/A
			PM-10	Lo Vol	N/A
			PM-10/Metals	Hi Vol	Reference
			VOC	Canisters, GC/FID/MS	Reference
			Carbonyls	HPLC Cartridges	Reference
			Wind Speed	Anemometer	N/A
			Wind Direction	Wind Vane	N/A
			Temperature	Spot Reading	N/A
			Relative Humidity	Plastic Film	N/A
Alton Jones Campus Victory Highway West Greenwich	440030002	41.615600 -71.719900	Ozone	U.V. Photometric	Reference
			Nitrogen Dioxide	Chemiluminescence	Reference
			Oxides Of Nitrogen	Chemiluminescence	Reference
			VOC	Canisters, GC/FID/MS	Reference
			PM-10	Hi Vol	Reference
			PM-2.5	Lo Vol	Reference
			PM-2.5	Beta Attenuation/Cont	N/A
			Wind Speed	Anemometer	N/A
			Wind Direction	Wind Vane	N/A
			Barometric Pressure	Barometer	N/A
			Temperature	Spot Reading	N/A
			Relative Humidity	Plastic Film	N/A
			Solar Radiation	Pyranometric	N/A

Figure 1
Air Quality Monitoring Network (2007)
Continous Monitors
Site Locations



Figure 2
PM-10 Air Pollution Monitoring Network
(2007)
Site Locations



Figure 3
PM-2.5 Air Pollution Monitoring Network
(2007)
Site Locations



Figure 4
Air Toxics Monitoring Network (2007)
Site Locations



